

CORRECTED VERSION

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
12 May 2005 (12.05.2005)

PCT

(10) International Publication Number  
**WO 2005/041942 A2**

(51) International Patent Classification<sup>7</sup>: **A61K 9/50**,  
C12N 5/08

(21) International Application Number:  
PCT/EP2004/012384

(22) International Filing Date:  
2 November 2004 (02.11.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
MI2003A002115 3 November 2003 (03.11.2003) IT

(71) Applicants (*for all designated States except US*): UNI-  
VERSITA' DEGLI STUDI DI MILANO [IT/IT]; Via  
Festa del Perdono, 7, I-20122 Milano (IT). UNIVER-  
SITA' DEGLI STUDI DI PAVIA [IT/IT]; Corso Strada  
Nuova, 65, I-27100 Pavia (IT). UNIVERSITA' DEGLI  
STUDI DI BOLOGNA [IT/IT]; Via Zamboni, 33, I-40126  
Bologna (IT).

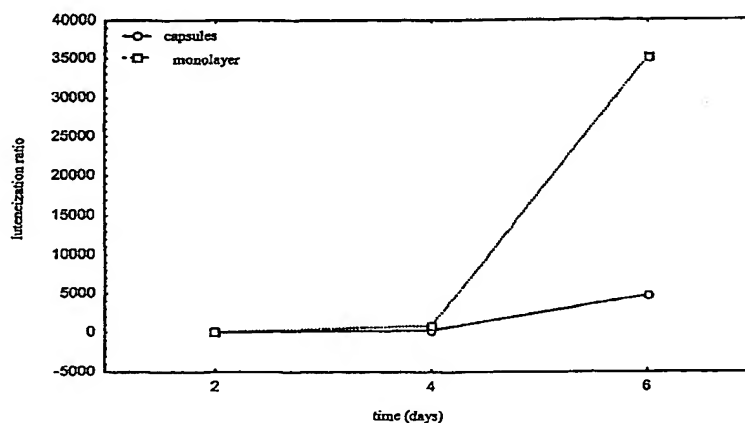
(72) Inventors; and

(75) Inventors/Applicants (*for US only*): VIGO, Daniele  
[IT/IT]; Università Degli Studi di Milano, Via Festa del  
Perdono, 7, I-20122 Milano (IT). RUSSO, Vincenzo  
[IT/IT]; Università Degli Studi di Milano, Via Festa del  
Perdono, 7, I-20122 Milano (IT). FAUSTINI, Massimo  
[IT/IT]; Università Degli Studi di Milano, Via Festa del  
Perdono, 7, I-20122 Milano (IT). STACCHEZZINI,  
Simona [IT/IT]; Università Degli Studi di Milano, Via  
Festa del Perdono, 7, I-20122 Milano (IT). CONTE,  
Ubaldo [IT/IT]; Università Degli Studi di Pavia, Corso  
Strada Nuova, 65, I-27100 Pavia (IT). TORRE, Maria,  
Luisa [IT/IT]; Università Degli Studi di Pavia, Corso  
Strada Nuova, 65, I-27100 Pavia (IT). ACCORSI, Pier,  
Attilio [IT/IT]; Università Degli Studi di Bologna, Via  
Zamboni, 33, I-40126 Bologna (IT). GALEATI, Gio-  
vanna [IT/IT]; Università Degli Studi di Bologna, Via  
Zamboni, 33, I-40126 Bologna (IT). SPINACI, Marcella  
[IT/IT]; Università Degli Studi di Bologna, Via Zamboni,  
33, I-40126 Bologna (IT).

(74) Agents: LONG, Giorgio et al.; Jacobacci & Partners  
S.p.A., Via Senato, 8, I-20121 Milano (IT).

[Continued on next page]

(54) Title: PREPARATION OF THREE-DIMENSIONAL MAMMALIAN OVARIAN FOLLICULAR CELL AND OVARIAN FOLLICLE CULTURE SYSTEMS IN A BIOCOMPATIBLE MATRIX



(57) Abstract: A process for encapsulating and immobilising mammalian stem cells, ovarian follicular cells, gametes, ovarian follicles or mammalian embryos which are able to auto-organise into three-dimensional structures *in vitro*, and express biological functions in a manner similar to that which is observed in the organism *in vivo* is described. The capsules are constituted by: a nucleus containing stem cells, ovarian follicular cells, gametes, ovarian follicles or mammalian embryos and/or a biocompatible and/or biodegradable polymer; a semi-permeable membrane constituted by a divalent or trivalent metal ion salt of alginic acid, optionally cross-linked on the inner and/or outer surface and/or on both surfaces, optionally vehicularising a second or more cellular species. The cells and follicles prepared and cultivated using this methodology are used for the *in vitro* and/or *in vivo* production of peptides, proteins, antibodies, hormones and hormone precursors, metabolites and catabolites typical of these cellular structures, plasma membranes, nuclear membranes, cytoplasmic organelles, somatic cell nuclei or gametes and embryos.

WO 2005/041942 A2



(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LU, MC, NL, PL, PT, RO, SE,

SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

**Published:**

— without international search report and to be republished upon receipt of that report

(48) Date of publication of this corrected version:

28 July 2005

**(15) Information about Correction:**

see PCT Gazette No. 30/2005 of 28 July 2005, Section II

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*